WHAT IS CLAIMED IS:

1. A method for generating a supply chain plan, comprising:

accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

generating a linear programming problem for the supply chain network;

approximating the linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraint to yield a relaxed constraint;

calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable; and

adjusting the optimized supply chain plan to satisfy the constraint.

2. The method of Claim 1, wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

adjusting at least one time value of the time variable of the selected buffer to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

planning production to supply the items to the selected buffer at the adjusted time value; and

proceeding to a next downstream buffer.

3. The method of Claim 1, wherein adjusting the optimized supply chain plan comprises:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

adjusting the quantity of items at the selected buffer to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

planning production to supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer.

4. The method of Claim 1, wherein adjusting the optimized supply chain plan comprises adjusting at least one time value of a time variable of at least one buffer to satisfy a lead time constraint.

5. The method of Claim 1, wherein adjusting the optimized supply chain plan comprises adjusting at least one time value of a time variable of at least one buffer to satisfy a feasible time constraint.

6. The method of Claim 1, wherein adjusting the optimized supply chain plan comprises adjusting a quantity of items of at least one buffer to satisfy a lot constraint.

7. The method of Claim 1, wherein adjusting the optimized supply chain plan comprises adjusting a quantity of items of at least one buffer to satisfy a capacity constraint.

8. A system for generating a supply chain plan, comprising:

a database operable to store data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

a linear programming optimizer coupled to the database and operable to:

generate a linear programming problem for the supply chain network;

approximate the linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraint to yield a relaxed constraint; and

calculate an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable; and

a heuristic solver coupled to the database and operable to adjust the optimized supply chain plan to satisfy the constraint.

9. The system of Claim 8, wherein the heuristic solver is operable to adjust the optimized supply chain plan by:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

adjusting at least one time value of the time variable of the selected buffer to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

planning production to supply the items to the selected buffer at the adjusted time value; and

proceeding to a next downstream buffer.

10. The system of Claim 8, wherein the heuristic solver is operable to adjust the optimized supply chain plan by:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

adjusting the quantity of items at the selected buffer to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

planning production to supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer.

11. The system of Claim 8, wherein the heuristic solver is operable to adjust the optimized supply chain plan by adjusting at least one time value of a time variable of at least one buffer to satisfy a lead time constraint.

12. The system of Claim 8, wherein the heuristic solver is operable to adjust the optimized supply chain plan by adjusting at least one time value of a time variable of at least one buffer to satisfy a feasible time constraint.

13. The system of Claim 8, wherein the heuristic solver is operable to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy a lot constraint.

14. The system of Claim 8, wherein the heuristic solver is operable to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy a capacity constraint.

15. Logic for generating a supply chain plan, the logic encoded in a computer-readable medium and when executed by a computer operable to:

access data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

generate a linear programming problem for the supply chain network;

approximate the linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraint to yield a relaxed constraint;

calculate an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable; and

adjust the optimized supply chain plan to satisfy the constraint.

16. The logic of Claim 15, the logic operable to adjust the optimized supply chain plan by:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

adjusting at least one time value of the time variable of the selected buffer to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

planning production to supply the items to the selected buffer at the adjusted time value; and

proceeding to a next downstream buffer.

17. The logic of Claim 15, the logic operable to adjust the optimized supply chain plan by:

repeating the following until a last upstream buffer is reached:

selecting a buffer;

adjusting the quantity of items at the selected buffer to satisfy the constraint; and

proceeding to a next upstream buffer; and

repeating the following until a last downstream buffer is reached:

selecting a buffer;

planning production to supply the adjusted quantity of items to the selected buffer; and

proceeding to a next downstream buffer.

18. The logic of Claim 15, the logic operable to adjust the optimized supply chain plan by adjusting at least one time value of a time variable of at least one buffer to satisfy a lead time constraint.

19. The logic of Claim 15, the logic operable to adjust the optimized supply chain plan by adjusting at least one time value of a time variable of at least one buffer to satisfy a feasible time constraint.

20. The logic of Claim 15, the logic operable to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy a lot constraint.

21. The logic of Claim 15, the logic operable to adjust the optimized supply chain plan by adjusting a quantity of items of at least one buffer to satisfy a capacity constraint.

22. A system for generating a supply chain plan, comprising:

means for accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

means for generating a linear programming problem for the supply chain network;

means for approximating the linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraint to yield a relaxed constraint;

means for calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable; and

means for adjusting the optimized supply chain plan to satisfy the constraint.

23. A method for generating a supply chain plan, comprising:

accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a plurality of constraints;

generating a linear programming problem for the supply chain network;

approximating the linear programming problem by discretizing the time variables of the buffers to yield a plurality of discretized time variables and by relaxing the constraints to yield a plurality of relaxed constraints;

calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items at each buffer for at least one time value of the corresponding time variable; and

adjusting the optimized supply chain plan to satisfy the constraints by repeating the following until a last upstream buffer is reached: selecting a buffer, adjusting at least one time value of the time variable of the selected buffer to satisfy a lead time constraint, adjusting the quantity of items at the selected buffer to satisfy a lot constraint, and proceeding to a next upstream buffer; and repeating the following until a last downstream buffer is reached: selecting a buffer, planning production to supply the adjusted quantity of items to the selected buffer at the adjusted time value, and proceeding to a next downstream buffer.

24. A method for generating an order plan, comprising:

accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

generating a linear programming problem for the supply chain network;

approximating the linear programming problem by discretizing the time variables of the buffers and by relaxing the constraint;

calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items for each buffer and a list of producers operable to supply the items to each buffer; and

generating an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

25. The method of Claim 24, wherein generating the order plan comprises repeating the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items;

planning production to supply the quantity of items to the selected buffer using at least some of the producers from the list of producers associated with the buffer; and

proceeding to a next upstream buffer.

26. The method of Claim 24, wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the items to the buffer using the producer;

determining a remaining quantity of items required by the buffer; and

proceeding to a next producer on the list.

27. The method of Claim 24, wherein generating the order plan comprises repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the quantity of items to the buffer using the producer;

proceeding to a next producer on the list if there is a next producer; and

planning production regardless of the list if there is no next producer.

28. The method of Claim 24, wherein generating the order plan comprises repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers operable to supply the items to the buffer after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the selected producer; and

proceeding to a next producer on the list.

29. The method of Claim 24, wherein generating the order plan comprises repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the producers operable to supply the items to the buffer at one or more supply times after the deadline;

planning production to supply at least some of the quantity of items to the buffer using a producer operable to supply the items at the selected supply time; and

proceeding to a next supply time.

30. A system for generating an order plan, comprising:

a database operable to store data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a time variable, the supply chain network constrained by a constraint;

a linear programming optimizer coupled to the database and operable to:

generate a linear programming problem for the supply chain network;

approximate the linear programming problem by discretizing the time variables and by relaxing the constraint; and

calculate an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing for each buffer a quantity of items and a list of producers operable to supply the items to each buffer; and

an order planner coupled to the database and operable to generate an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

31. The system of Claim 30, wherein the order planner is operable to repeat the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items;

planning production to supply the quantity of items using at least some of the producers from the list of producers associated with the buffer; and

proceeding to a next upstream buffer.

32. The system of Claim 30, wherein the order planner is operable to repeat the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the items to the buffer using the producer;

determining a remaining quantity of items required by the buffer; and

proceeding to a next producer on the list.

33. The system of Claim 30, wherein the order planner is operable to repeat the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the quantity of items to the buffer using the producer;

proceeding to a next producer on the list if there is a next producer; and

planning production regardless of the list if there is no next producer.

34. The system of Claim 30, wherein the order planner is operable generate the order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers operable to supply the items to the buffer after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the selected producer; and

proceeding to a next producer on the list.

35. The system of Claim 30, wherein the order planner is operable to generate the order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the producers operable to supply the items to the buffer at one or more supply times after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the producer operable to supply the items at the selected supply time; and

proceeding to a next supply time.

36. Logic for generating an order plan, the logic encoded in a computer-readable medium and when executed by a computer operable to:

access data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

generate a linear programming problem for the supply chain network;

approximate the linear programming problem by discretizing the time variables of the buffers and by relaxing the constraint;

calculate an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items for each buffer and a list of producers operable to supply the items to each buffer; and

generate an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

37. The logic of Claim 36, the logic operable to generate the order plan by repeating the following until a last upstream buffer is reached:

selecting a buffer that requires a quantity of items;

planning production to supply the quantity of items to the selected buffer using at least some of the producers from the list of producers associated with the buffer; and

proceeding to a next upstream buffer.

38. The logic of Claim 36, the logic operable to generate the order plan by repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the items to the buffer using the producer;

determining a remaining quantity of items required by the buffer; and

proceeding to a next producer on the list.

39. The logic of Claim 36, the logic operable to generate the order plan by repeating the following until production to supply a quantity of items to a buffer is planned:

selecting a producer from the list of producers associated with the buffer;

planning production to supply at least some of the quantity of items to the buffer using the producer;

proceeding to a next producer on the list if there is a next producer; and

planning production regardless of the list if there is no next producer.

40. The logic of Claim 36, the logic operable to generate the order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a producer from the list of producers associated with the buffer, the producers operable to supply the items to the buffer after the deadline;

planning production to supply at least some of the quantity of items to the buffer using the selected producer; and

proceeding to a next producer on the list.

41. The logic of Claim 36, the logic operable to generate the order plan by repeating the following if a quantity of items cannot be supplied to a buffer by a deadline, until the quantity of items for the buffer is planned:

selecting a supply time according to the list of producers associated with the buffer, the producers operable to supply the items to the buffer at one or more supply times after the deadline;

planning production to supply at least some of the quantity of items to the buffer using a producer operable to supply the items at the selected supply time; and

proceeding to a next supply time.

42. A system for generating an order plan, comprising:

means for accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

means for generating a linear programming problem for the supply chain network;

means for approximating the linear programming problem by discretizing the time variables of the buffers and by relaxing the constraint;

means for calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items for each buffer and a list of producers operable to supply the items to each buffer; and

means for generating an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer.

43. A method for generating an order plan, comprising:

accessing data describing a supply chain network comprising a plurality of buffers, each buffer being operable to store a plurality of items and associated with a corresponding time variable, the supply chain network constrained by a constraint;

generating a linear programming problem for the supply chain network;

approximating the linear programming problem by discretizing the time variables of the buffers and by relaxing the constraint;

calculating an optimized supply chain plan for the approximated linear programming problem, the optimized supply chain plan describing a quantity of items for each buffer and a list of producers operable to supply the items to each buffer; and

generating an order plan by planning production to supply the quantity of items to each buffer according to the list of producers associated with the buffer by repeating the following until production to supply a quantity of items to a buffer is planned: selecting a producer from the list of producers associated with the buffer, planning production to supply at least some of the items to the buffer using the producer, determining a remaining quantity of items required by the buffer, and proceeding to a next producer on the list.